3-4240-201-13

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, AND DIRECT SUPPORT

MAINTENANCE MANUAL

FILTER UNIT, GAS-PARTICULATE, HOSPITAL, SIX-MAN, 12 CFM, ABC-M7A1 (FSN 4240-203-3999)

HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1972

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WARNINGS

The mission oriented protective posture (MOPP) (FM 21–40) directs that when a threat of a chemical attack exists, the attendant and the six patients must be masked beforehand to be safe.

Headpieces cannot be put on six patients by one operator (attendant) in the time the patients can be expected to hold their breath. Therefore, since some of the patients may be able to put on their own headpieces, they should be taught to do so. Also, patients should be taught to help each other don the headpieces.

The unit commander or senior officer in charge of maintenance personnel assigned to remove and dispose of the contaminated gas filter and particulate filter must prescribe the necessary protective clothing (TM 10–277) to be worn during this operation. He must also prescribe the necessary safety measure to be followed including decontamination operation that must be performed before new filters are installed in the housing assembly (TM 3–220).

A contaminated gas filter and particulate filter must be removed and disposed of only by adequately trained personnel (FM 21–40). The headpieces should be decontaminated after each use. When the headpiece is used, it is considered contaminated.

Disconnect the power cable with the 90° plug connector from the air purifier before performing maintenance.

TECHNICAL MANUAL
No. 3–4240–201–13

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *15 November 1972*

Operator's Organizational, and Direct Support Maintenance Manual

FILTER UNIT, GAS-PARTICULATE, HOSPITAL, SIX-MAN, 12 CFM, ABC–M7A1 (FSN 4240–203–3999)

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*This manual supersedes TM 3–4240–201–12, 5 July 1961 and TM 3–4240–201–35, 11 September 1961, including all changes.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

These instructions are for use by operator, organizational, and direct support maintenance. They apply to the Filter Unit, Gas-Particulate, Hospital, Six-Man, 12 CFM, ABC-M7A1. Hereinafter this equipment will be referred to as filter unit (fig. 1-1). The battery and jumper shown in figure 1-1 are not issued with the filter unit.

1-2. Record and Report Forms

a. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750.

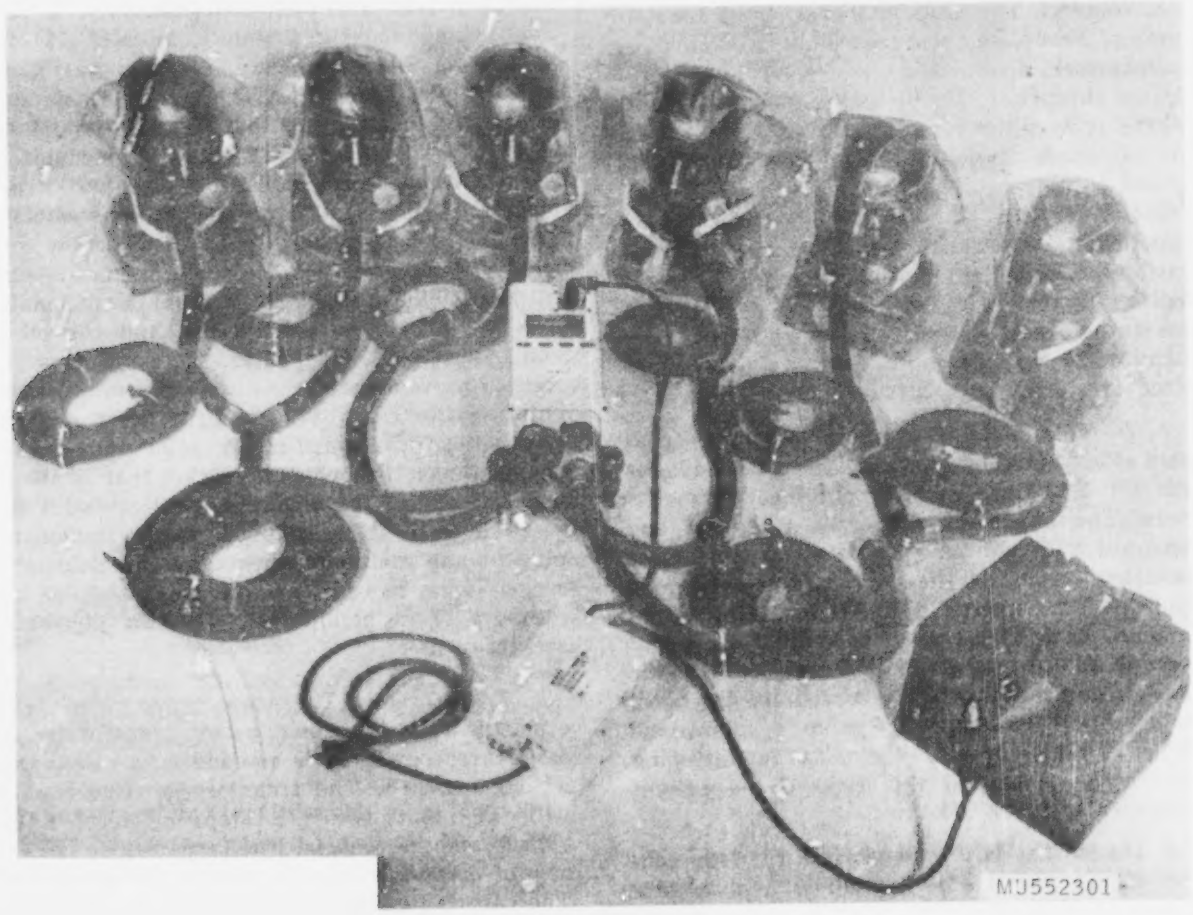


Figure 1-1. ABC-M7A1 12 CFM six-man hospital gas-particulate filter unit.

b. Use DD Form 6 (Report of Packaging and Handling Deficiencies) to report damaged or improper shipment of materiel.

c. The reporting of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, Edgewood Arsenal, ATTN: SMUEA-DE-ET, Edgewood Arsenal, MD 21010.

d. Refer to TM 740-90-1 for administrative storage instructions for this filter unit.

e. Refer to FM 5-25 and TM 9-1375-200 for destruction instructions on this equipment.

Section II. DESCRIPTION AND DATA

1-3. Use

The filter unit adsorbs toxic gases, dusts, and aerosols from the air and supplies purified respiratory air to six or fewer hospital patients. These patients have wounds or bandages on the neck, face, or head and cannot wear a conventional mask.

1-4. Description

a. General. The filter unit consists of the following: headpiece, hose assembly, air purifier, transformer, accessories, and repair kit. Air is drawn through intake holes in the air purifier where it is filtered and purified. The purified air is blown through hoses to the headpieces. Power to operate the purifier is controlled by a transformer unit. The electrical power normally supplied to the transformer is 115 volt alternating current (ac) with emergency 24 volt battery power. If the 115 volt ac power fails, the transformer automatically switches to the standby 24 volt dc power source. Each headpiece is stored in a carrier when not in use.

b. Headpiece. The headpiece (fig. 1-2) consists of six M13A1 hospital filter unit headpieces and six M12 hospital filter unit headpiece carriers. The headpiece carrier is a plastic bag equipped with a buckle and a strap. When the headpiece is inside the carrier, the carrier is folded on the marked lines, rolled tightly, and fastened with the strap and buckle. The headpiece is a hood that fits loosely over the patient's head. The plastic headpiece consists of the hood, inlet adapter mount, outlet valve, eyepiece, and strap. The strap provides the means for fastening the headpiece around the neck of the patient as shown in figure 1-1.

c. Hoses. The hose assemblies (fig. 1-3) consist of two size 3 hose assemblies and six size 2 hose assemblies.

(1) *Size 2 hose assembly.* Each size 2 hose assembly consists of a 6-foot airduct hose, two ratchet clamps, a pulomatic plug, and an inlet adapter.

(2) *Size 3 hose assembly.* Each size 3 hose assembly consists of a 9-foot airduct hose, two ratchet clamps, one pulomatic plug, and one Y-fitting and socket.

d. Air Purifier. The M2A2 air purifier (fig. 1-4) consists of a manifold assembly, a precleaner and housing assembly, an M13 12 cfm particulate filter, an M12A1 12 cfm gas filter, and airflow control caps. The manifold assembly closes the air outlet end and the end plate closes the inlet end of the air purifier. The manifold assembly has four (earlier models have three) pulomatic sockets for attaching hose assemblies. The four sockets are equipped with airflow control caps. Each airflow control cap has a ring in its middle which fits around a pulomatic socket. One end is a solid cap and the other end has a hole in its center. The solid caps are used to prevent foreign matter or moisture from entering the gas filter when the hoses are not attached to the purifier. A solid end cap is snapped over the pulomatic socket that is not in use. The end of the airflow control cap with the small hole in it is snapped over a pulomatic plug on the manifold when a second pulomatic socket is not in use. This prevents excessive air pressure from building in the two pulomatic sockets in use.

e. Transformer. The transformer (fig. 1-5) consists of a step down power transformer, a case, three power cable assemblies, a relay, and a toggle switch. The transformer receives 115 volts ac input, which it steps down to a 30 volts 3 amperes output. The transformer is capable of operating on a 24 volts dc power source. The case is marked to identify the three power cables as follows: LEAD TO 115 V 60 HZ SUPPLY; LEAD TO 24 V BATTERY; and LEAD

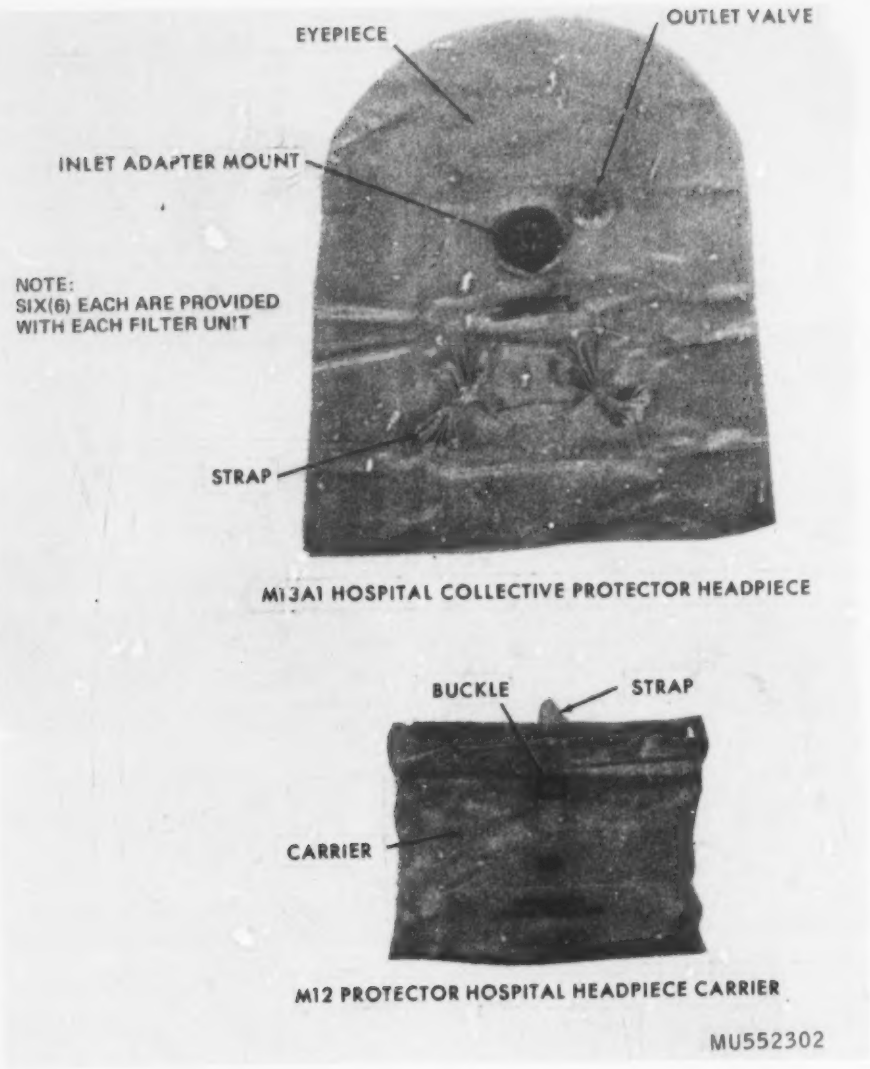


Figure 1–2. Headpiece.

TO PURIFIER. See figure 1–6 for wiring diagram.

f. Accessories. The accessories (fig. 1–7) consist of TM 3–4240–201–13, machine screws, wood screws, nuts, clamps, and a plug and socket Y-fitting.

g. Identification. Identification of a filter unit is made by the nameplate (fig. 1–8) on the air purifier body.

1–5. Tabulated Data

All numerical data are approximate.

a. Packaged Filter Unit.

Weight	138 lb
Cubage	5.5 cu ft
Dimensions:	
Length	22¼ in.
Width	21 in.
Depth	18½ in.

b. External Electrical Power Sources Required.

24 volts dc source
115 volts ac 60 Hz source

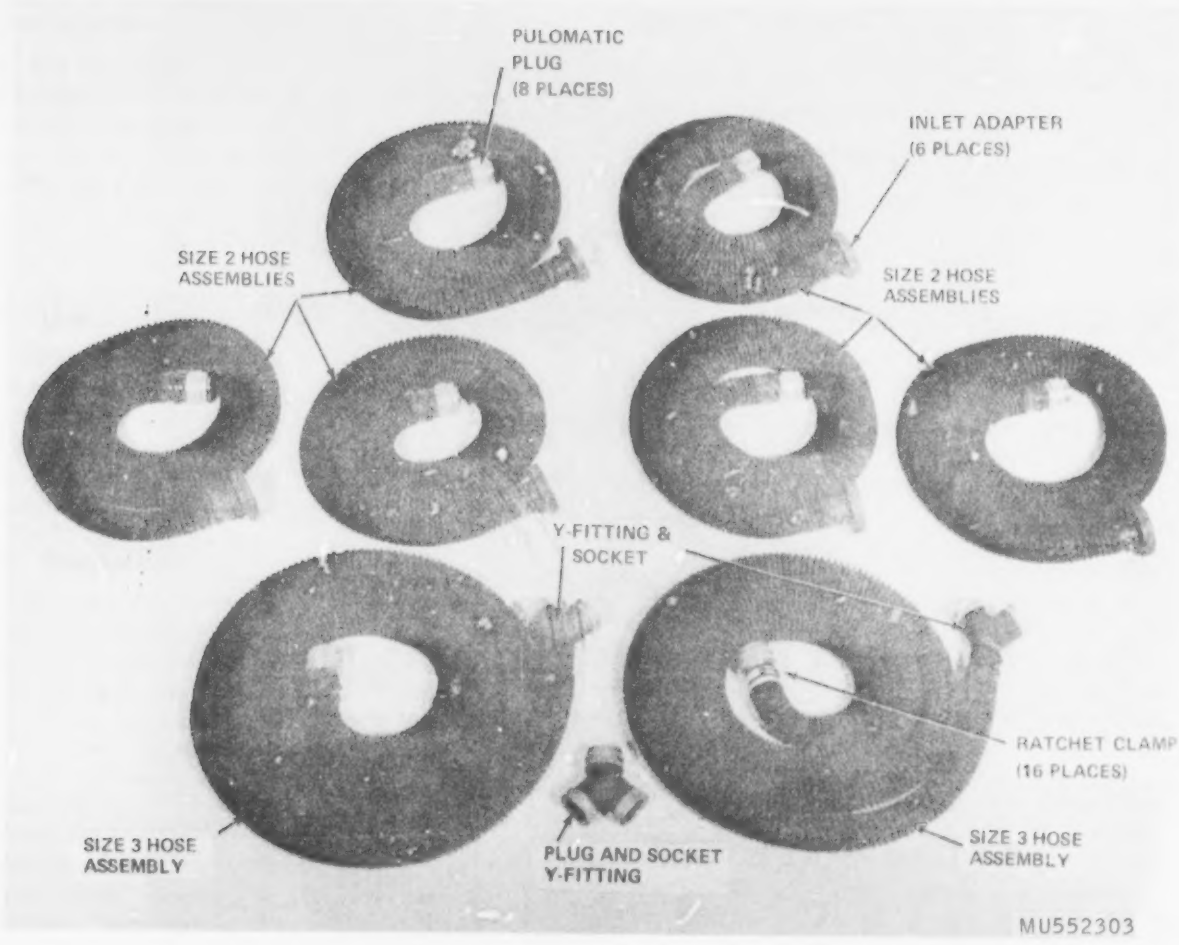


Figure 1-3. Hoses.

c. Air Purifier Assembly.

Length	13 in.
Width	7½ in.
Height	6 in.
Weight	20¼ lb

d. Performance Characteristics.

Delivery to each headpiece	1.75 to 2.3 cu ft/min
Maximum personnel protected	6 patients

1-6. Expendable Items

Expendable items are authorized in accordance with the provisions of Supply Bulletin 700-50. Expendable items required for use with this filter unit, including paints, are listed in table 1-1 below. However, in SB 700-50, paints are listed under the heading: Ink, marking, etc.

Table 1-1. Expendable Items

Item No.	Nomenclature	Use	Federal stock No.
1	Ink, Marking Stencil, Semigloss (Fed Std No. 27038).	For marking nonporous surfaces (black)	7510-224-6734
2	Ink, Print, Opaque, Semigloss (Fed Std No. 27875).	For painting exterior surfaces (white)	7510-985-7007
3	Soap, Toilet, Floating Type, Cake Form	For cleaning headpieces and carriers	8520-231-3006

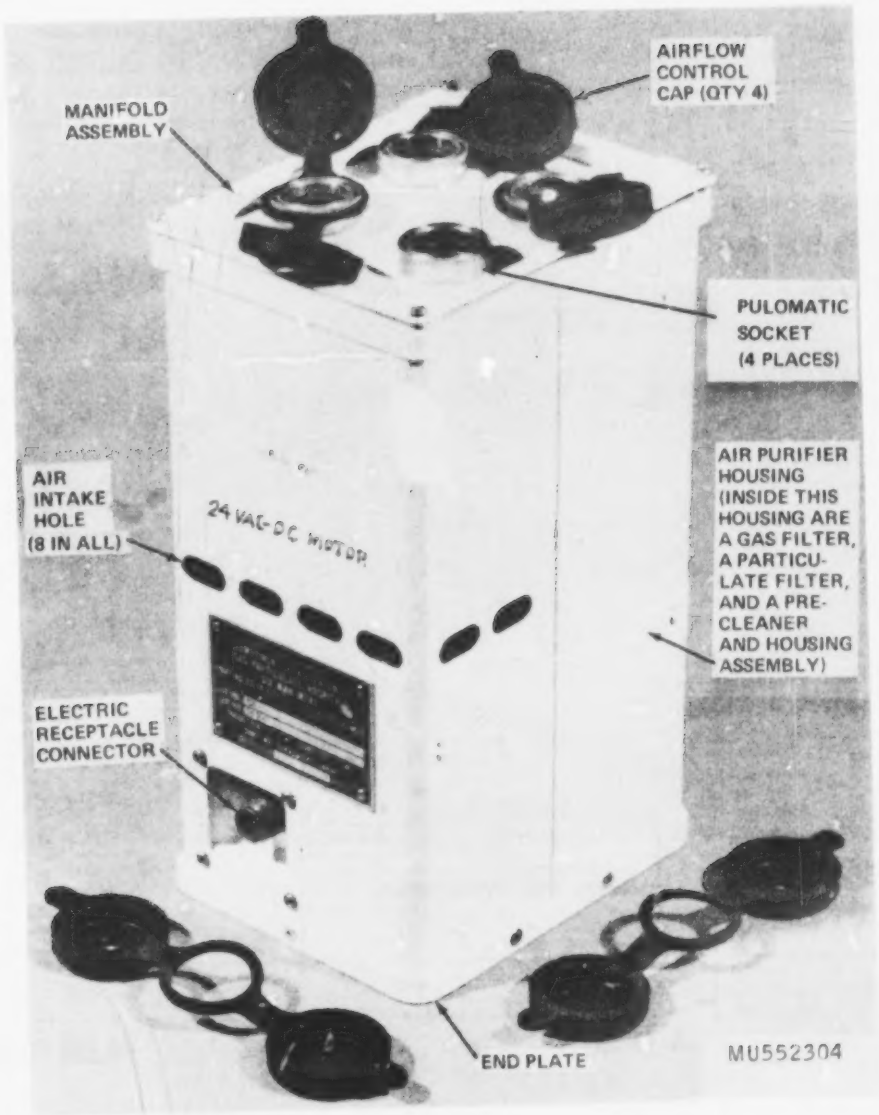

AIRFLOW CONTROL CAP (QTY 4)
MANIFOLD ASSEMBLY
PULOMATIC SOCKET (4 PLACES)
AIR PURIFIER HOUSING (INSIDE THIS HOUSING ARE A GAS FILTER, A PARTICU-LATE FILTER, AND A PRE-CLEANER AND HOUSING ASSEMBLY)
AIR INTAKE HOLE (8 IN ALL)
24 VAC-DC MOTOR
ELECTRIC RECEPTACLE CONNECTOR
END PLATE
MU552304

Figure 1-4. M2A2 air purifier assembly.

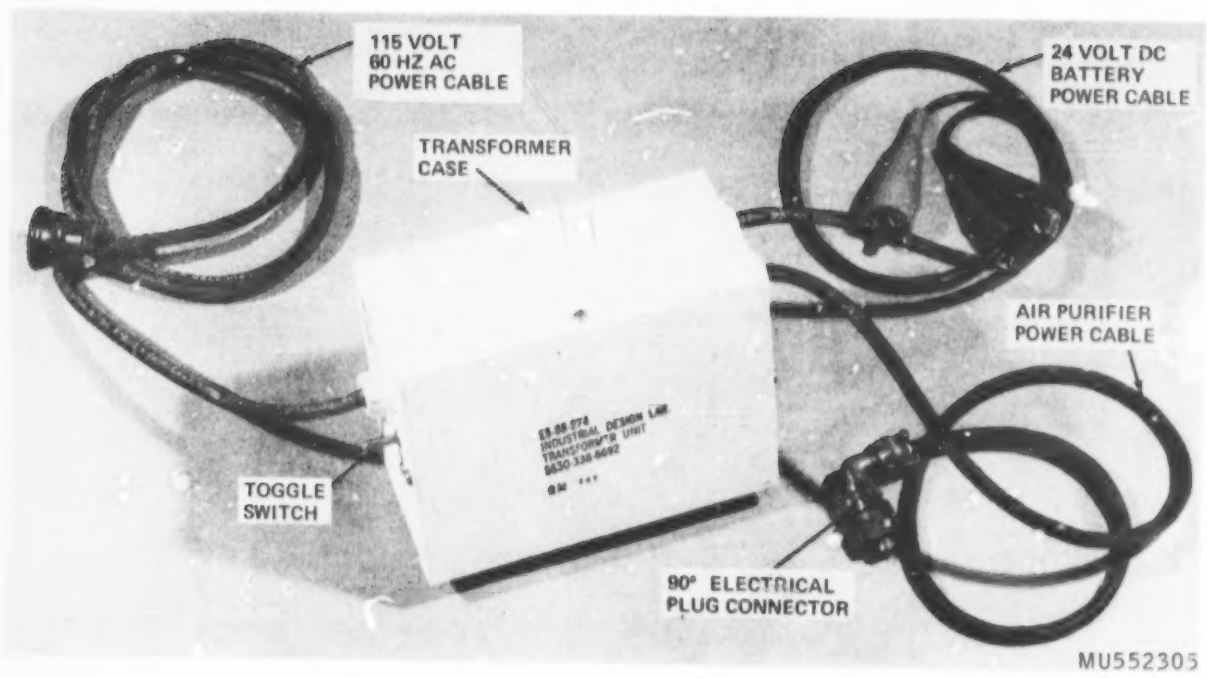


Figure 1-5. Transformer.

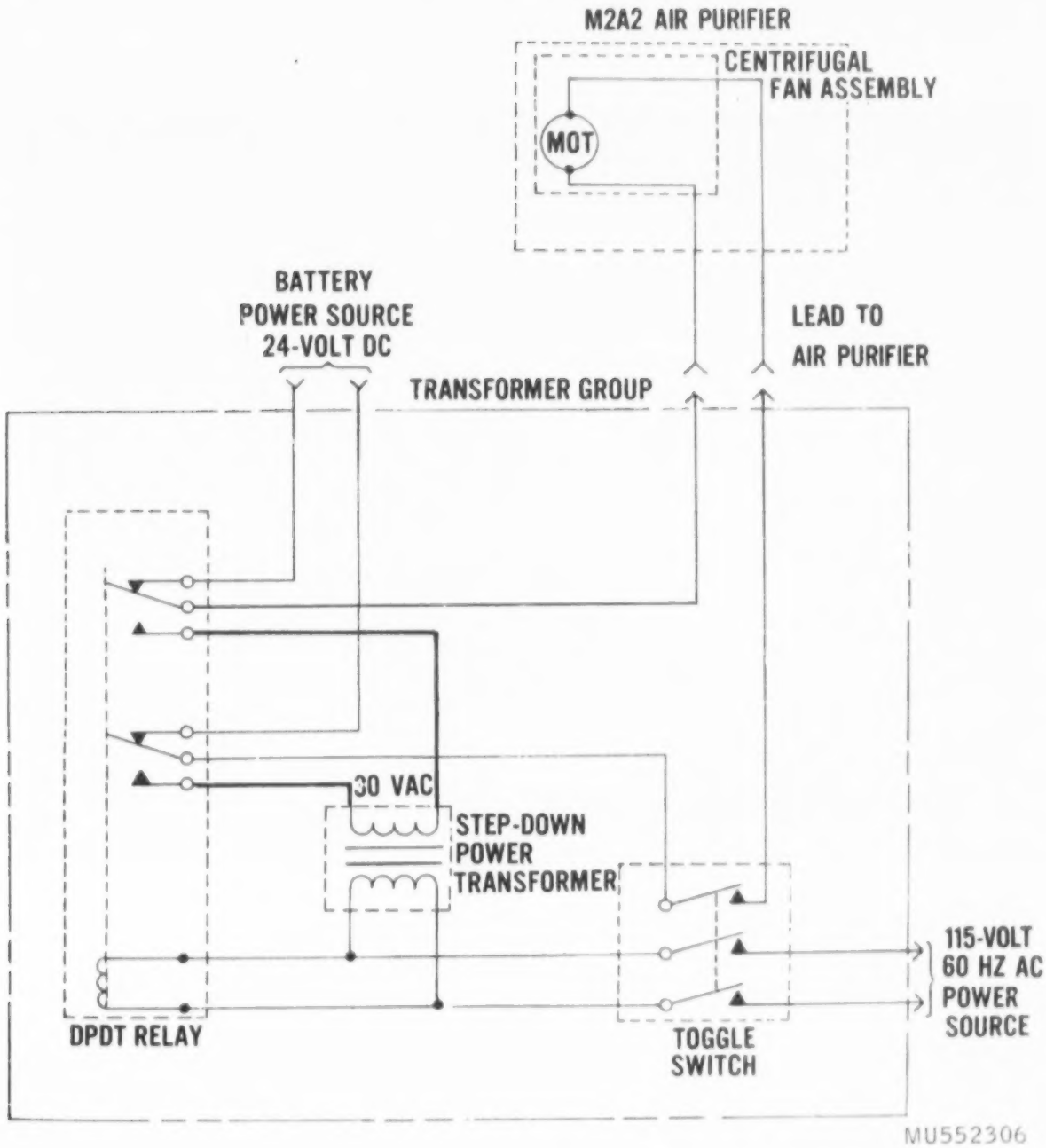


Figure 1-6. Wiring diagram.

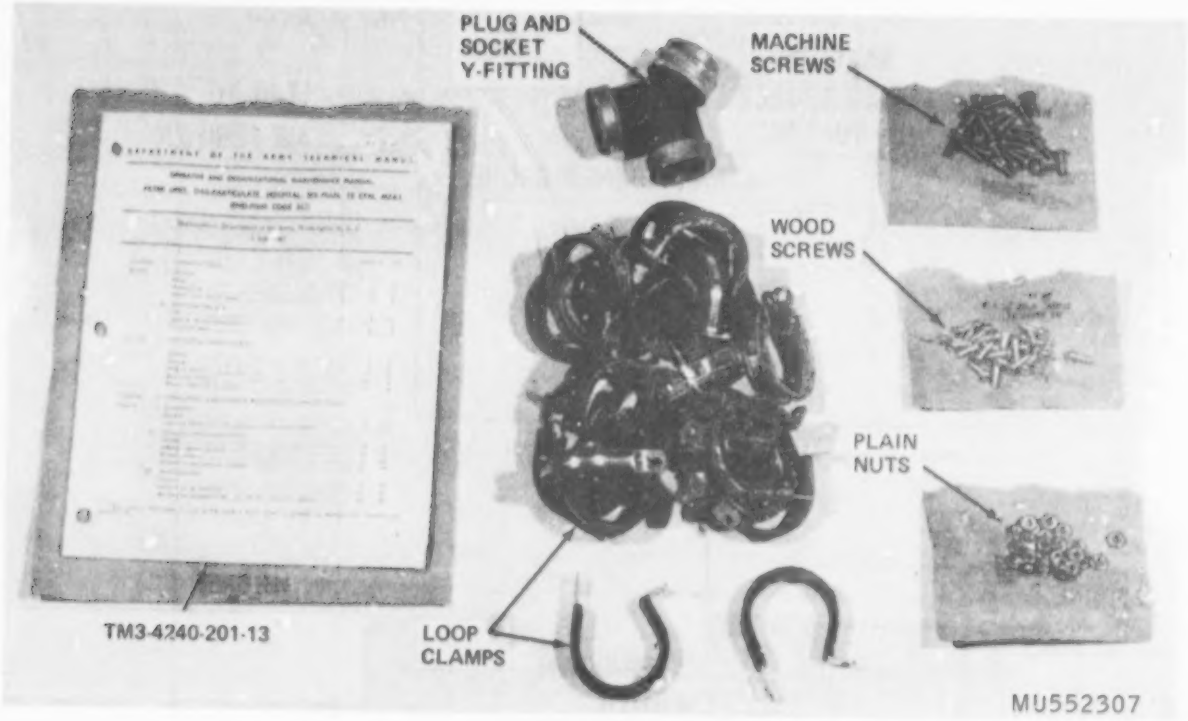


Figure 1-7. Accessories.

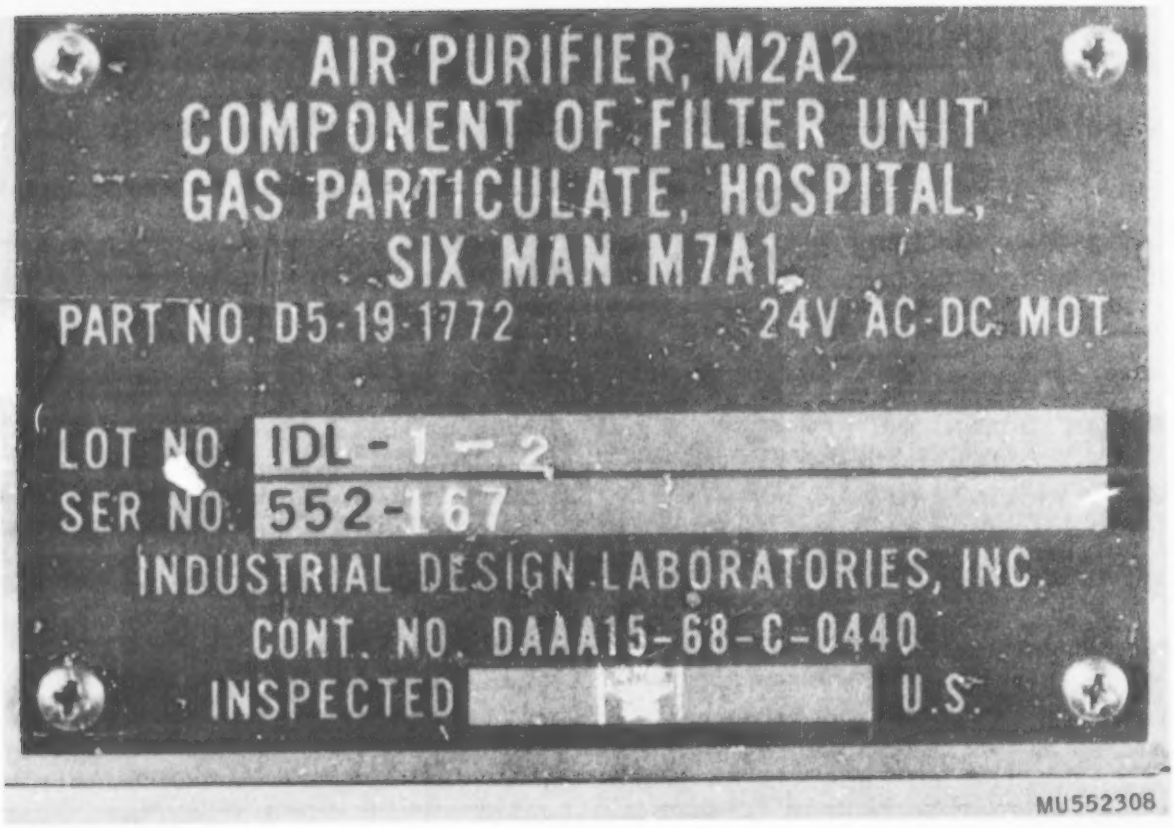


Figure 1-8. Identification nameplate.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

2-1. General

The toggle switch is the only control for the filter unit. There are no instruments required for the operation of the filter unit.

2-2. Toggle Switch

a. Location. The toggle switch is located on the side of the transformer case.

b. Purpose. The toggle switch is used by the operator (attendant) to turn the filter unit power supply on and off.

Section II. OPERATION UNDER USUAL CONDITIONS

2-3. General

The filter unit is installed by organizational maintenance personnel in a location convenient to the patients who are to be protected.

2-4. Putting Headpieces on Patients and Operation

WARNING

The mission oriented protective posture (MOPP) (FM 21-40) directs that when a threat of a chemical attack exists, the attendant and the six patients must be masked beforehand to be safe.

WARNING

Headpieces cannot be put on six patients by one attendant in the time the patients can be expected to hold their breath. Therefore, since some of the patients may be able to put on their own headpieces, they should be taught to do so. Also, patients should be taught to help each other don the headpieces.

a. Preparation. The following preparations should be made by the attendant:

(1) Remove the headpiece from the carrier.

(2) Screw the inlet adapter of the hose assembly into the inlet adapter mount of the headpiece.

(3) Place the headpiece near the patient ready for immediate use.

(4) Make sure that the hose is long enough to permit putting the headpiece on the bed patient without difficulty (fig. 2-1).

(5) Plug 115 vac power cable into 115v outlet and connect 24 vdc power cable to batteries.

b. Masking Procedure.

(1) Place the toggle switch on the transformer case in ON position.

(2) Make sure that air is being supplied to all headpieces.

(3) Place the headpiece over the patient's head with the eyepiece positioned over the patient's eyes.

(4) Pass the neck strap on the headpiece around the patient's neck. Tie the strap tight enough to restrict flow of air around the patient's neck but not so tight as to cause him discomfort.

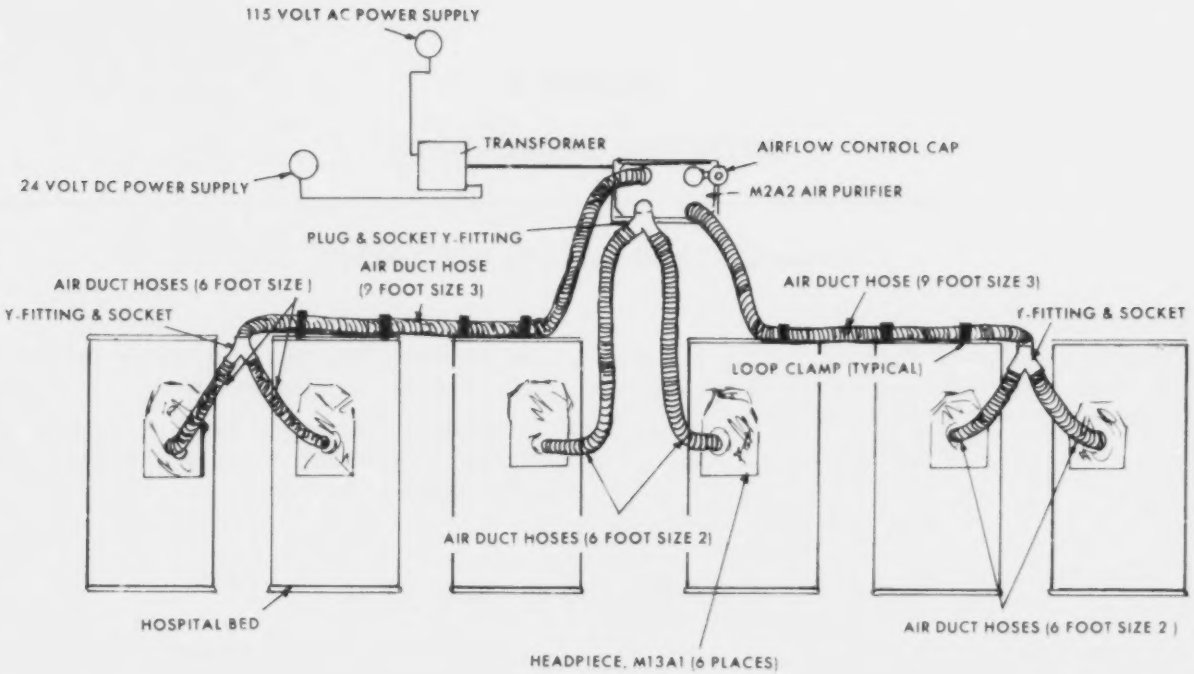

115 VOLT AC POWER SUPPLY
TRANSFORMER
AIRFLOW CONTROL CAP
24 VOLT DC POWER SUPPLY
M2A2 AIR PURIFIER
PLUG & SOCKET Y-FITTING
AIR DUCT HOSE (7 FOOT SIZE 3)
AIR DUCT HOSES (6 FOOT SIZE)
AIR DUCT HOSE (9 FOOT SIZE 3)
Y-FITTING & SOCKET
Y-FITTING & SOCKET
LOOP CLAMP (TYPICAL)
AIR DUCT HOSES (6 FOOT SIZE 2)
HOSPITAL BED
AIR DUCT HOSES (6 FOOT SIZE 2)
HEADPIECE, M13A1 (6 PLACES)
NOTE:
THE THREE Y-FITTINGS CONTAIN ORIFICES THAT CONTROL THE AMOUNT OF AIR SUPPLIED TO EACH HEADPIECE
ROUTING OF HOSE ASSEMBLIES IS OPTIONAL
MU552309

Figure 2-1. Filter unit, hose, and headpiece connections to hospital beds, recognition view.

2-5. Removing and Cleaning Headpiece

a. Removal of Headpiece. Untie the strap. Lift the headpiece clear of the patient's head. Place the headpiece near the patient ready for immediate use. Place the toggle switch on the transformer case in OFF position.

b. Sanitizing of Headpieces. After each use, clean the headpiece inside and out. Use a clean cloth that has been dipped in warm soapy water solution (item 3, table 1-1). Rinse by wiping with a clean cloth that has been dipped in warm clear water and wrung almost dry. Air-dry all surfaces of the headpiece.

c. Decontamination of Headpieces. Decontaminate the headpieces in accordance with instructions in TM 3-220.

2-6. Filter Change Criteria

Refer to table 2-1 to check the remaining protective life of gas filters. Notify organizational maintenance personnel to replace the gas filter when one or more of the conditions in table 2-1 are met.

Table 2-1. Filter Change Criteria for M12A1 Gas Filter and M13 Particulate Filter

1.	Physical damage.
2.	Water immersion.
3.	Low airflow to headpieces (cause resistance in filter). Organizational maintenance personnel will determine what fault is.
4.	10,000 hours of operation (no chemical agent used—wartime operation).
5.	1,500 hours (approx 5 months) of operation (chemical agent used—wartime operation).
6.	After each CK attack—change as soon as possible.
7.	At beginning of combat conditions and when use of CK is expected.

Section III. OPERATION OF THE FILTER UNIT

2-7. Power Supply

a. Transformer. The transformer, a part of the filter unit, receives the external power supply. The 115 volt 60 Hz ac power supply and the 24 volt dc power supply are not part of this filter unit.

b. General. Make sure that the toggle switch on the transformer is in OFF position. Make sure that the power cable that extends from the transformer group is connected to the air purifier. Then connect the two power cables that extend from the transformer as follows:

(1) to the 115 volt 60 Hz ac power source.

(2) to the 24 volt dc power source. The black cable nipple and clip connect to the negative terminal of the battery and the red cable nipple and clip connect to the positive terminal of the battery.

NOTE

Two 12 volt batteries must be connected in series as shown in figure 1-1 in order to get the required 24 volt dc power supply as shown in the wiring diagram (fig. 1-8).

c. Electrical Operation. When the toggle switch is turned on and the 115 volt power cable is connected to a power source, current flows through the primary winding of the step down power transformer and through the armature of the relay, actuating the relay. The secondary winding of the step down power transformer is connected through the toggle switch to the centrifugal fan in the air purifier. If the 115 volt ac power source ceases for any reason, current ceases to flow through the armature of the relay, and the relay contacts open. The 24 volt dc power source is connected to the centrifugal fan through a second set of contacts that are closed in the relay and through the toggle switch. If at any time during the operation 115 volt ac power becomes available, the relay connects the secondary windings of the transformer to the centrifugal fan and disconnects the 24 volt dc power supply. The centrifugal fan operates on 24 volts dc or 30 volts ac. The centrifugal fan blows the air to the six headpieces through the connected hoses.

d. 115 Volt 60 Hz ac Power Cable. The 115 volt 60 Hz ac power cable is 6 feet long. It is a two wire rubber covered cable that connects into ordinary housepower outlets by plug connector.

e. 24 Volt dc Power Cable. The 24 volt dc power cable is 3 feet long. It is a two wire rubber covered cable that has two clips covered with one black and one red plastic cable nipples. Squeezing the cable nipples opens the spring-loaded clips. Clamp the black clip over the negative terminal and the red clip over the positive terminal.

f. Relay. The relay is a double pole double throw relay that operates when 115 volt 60 cycle ac power is applied to the armature. The relay is inside the transformer case and it operates automatically when the toggle switch is on with 115 volts ac power applied.

g. Air Purifier Cable. The air purifier cable is 3 feet long. It is a two wire rubber covered cable with a 90° electrical connector. The air purifier cable connects the transformer to the air purifier.

2-8. Protective Masks

A protective mask will be required for each operator of the filter unit. The operator may be referred to as nurse, orderly, attendant, doctor, medic, aid man, or operator. The operator is responsible for first donning a protective mask; and then putting headpieces on six patients. A headpiece is not intended to be worn by the operator (attendant) of the filter unit. The protective mask required for the operator is *not* part of this filter unit. The protective mask required for operator protection is the authorized field protective mask.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-9. General

Operation under unusual conditions includes cold weather, wet weather, mud, seaside, high humidity, and high temperatures. Protect the filter unit from exposure to any of these conditions as much as possible.

2-10. Details

a. Keep the filter unit free of sand, moisture, mud, or any other foreign matter.

b. Protect the filter unit from snow and ice. Operate equipment within temperature limits of +32° F. to +140° F.

c. When operating filter unit where temperature, humidity, and salt air are present, clean and dry the equipment as often as necessary.

d. During operations in sand or dust storms, keep the filter unit and the patients under protective cover as much as conditions permit.

e. If the filter unit becomes wet or dirty, wipe it off at once using clean dry cloths.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-1. General

This section provides in table 3-1 the operator with a list of services which must be performed at the intervals prescribed. Intervals of maintenance are based on normal operation and will be reduced or extended depending on operating conditions. The filter unit will normally be used on very short notice. This equipment must be kept in a constant state of readiness.

3-2. Preventive Maintenance Checks and Services

Table 3-1, preventive maintenance checks and services, provides a list of services that the operator must perform either before or after operation. Defects that are discovered during preventive maintenance servicing must be corrected immediately. The number also indicates the sequence in which the service must be performed.

Table 3-1. Preventive Maintenance Checks and Services

B-Before operation
Time required: 1.1 hours

A-After operation
Time required: 1 hour

Interval and sequence No.		Item to be inspected procedure	Work time (M/H)
B	A		
1	9	*Publication.* See that a copy of TM 3-4240-201-13 is available and in serviceable condition.	0.1
2	10	*Overall Visual Inspection.* See that the filter unit (fig. 1-1) is clean and all parts are free of rust, pitting, corrosion, and dry rot. See that none of the components are missing or damaged.	0.2
3	11	*Air Purifier.* Check housing (fig. 1-4) for dents and loose connections. Notify organizational maintenance to replace gas filter and particulate filter when they become contaminated (table 2-1). See that airflow control caps are in place and in good condition.	0.1
4	12	*Transformer.* Check transformer case (fig. 1-5) for damaged, loose, or missing cables, damaged connectors, loose or missing screws, and broken toggle switch.	0.1
5	13	*Battery.* Check electrolyte level in battery (fig. 1-1) cells visually. Maintain liquid level in battery cells by adding distilled water as necessary. Clean the terminals and remove corrosion. See that protective cable nipples cover both clips of the 24 volt dc power cable.	0.1
6	14	*Hoses.* See that hoses are routed according to the diagram (fig. 2-1). See that hoses are not stretched or sharply bent. See that loop clamps are used to support hoses along their lengths. Check ratchet clamps, inlet adapter, pulomatic plug, and Y-fittings for damage.	0.2
7	15	*Headpiece and Carrier.* Check headpieces (fig. 1-2) for cleanliness, holes, and loose or cracked plastic material. See that inlet adapter mount, strap, and outlet valve are not damaged. Check for missing carriers.	0.2
8	16	*Operational Check.* Move toggle switch to ON position to see that it operates. Remove 115 vac power cable from ac power source to see that it automatically transfers to dc power source. If it is satisfactory, place toggle switch to OFF position. Plug the 115 vac power cable in to the power source.	0.1

Section II. TROUBLESHOOTING

3-3. General

This section provides information which will aid the operator in diagnosing and correcting unsatisfactory operation or failure of the filter unit to operate. If corrective action is not authorized to the operator, defects in the filter unit must be reported to organizational maintenance.

3-4. Troubleshooting Table

Table 3-2, troubleshooting, lists in tabular form item number, malfunction, probable cause, and corrective action to be taken. The operator will find the information in table 3-2 useful in locating and correcting malfunctions.

Table 3-2. Troubleshooting

Item No.	Malfunction	Probable cause	Corrective action
1	Air purifier does not operate	*a.* Toggle switch in OFF position	*a.* Move toggle switch to ON position.
		b. Power cables not connected	*b.* Connect power cables.
		c. Solid portion of airflow control cap not installed properly.	*c.* Install solid portion of airflow control cap over pulomatic socket.
		d. dc power, weak battery	*d.* Notify organizational maintenance.
2	Air purifier operates on ac but not on dc.	Battery discharged	Notify organizational maintenance.
3	Lack of air at one headpiece	*a.* Hose disconnected	*a.* Connect hose.
		b. Hose broken or hose leaks	*b.* Notify organizational maintenance.
4	Air reaches headpieces but not in sufficient quantity.	*a.* Air purifier assembly air intake holes (fig. 1-4) blocked.	*a.* Uncover air intake holes. If fault is not corrected, notify organizational maintenance.
		b. Leak in hose	*b.* Notify organizational maintenance.

Section III. MAINTENANCE

3-5. Headpiece

a. Inspection. Examine the headpiece for damage. Check each carrier and headpiece, paying special attention to the hood, eyepiece, inlet adapter mount, and outlet valve. Make sure that there are no breaks or cracks in the plastic material.

b. Servicing. Servicing consists of cleaning and drying the headpiece to insure that the headpiece is sanitary for wear. Make sure that each carrier is clean and decontaminated before placing a headpiece into it.

c. Replace. Unscrew the inlet adapter from the inlet adapter mount on a defective headpiece. Place the headpiece in its carrier and turn it in for replacement. Remove the new headpiece from its carrier. Screw the inlet adapter into the inlet adapter mount handtight. Fasten the carrier to the head of the hospital bed.

3-6. Hose Assemblies

Operator maintenance of the hose assembly (fig. 2-1) is restricted to inspection only. Examine the hoses (fig. 1-3) to see that they are free of dry rot, free of signs of unusual wear, not stretched or twisted out of shape, that pulomatic plugs are undamaged, are not loose, and that Y-fitting and socket, plug and socket Y-fitting, inlet adapters, and ratchet clamps are all in place. Check that hoses are adequately supported by loop clamps (fig. 1-7) as they are routed from the air purifier to the six beds. If any deficiencies are noted in the hose assembly, notify organizational maintenance.

3-7. Air Purifier

a. Inspection. Inspect the air purifier externally for damage, missing parts, and loose connections. See that an airflow control cap is on each pulomatic socket of the manifold assembly and that the airflow control caps are undamaged. See that the purifier power cable is tightly fastened to the electric receptacle connector.

b. Service. Operator service of the purifier is restricted to cleaning the exterior housing. Use a clean damp cloth and wipe all surfaces dry afterwards. Insure that no water enters the pulomatic sockets.

c. Replacing Airflow Control Caps. If an airflow control cap requires replacement, disconnect the hose assembly at the pulomatic socket on the manifold assembly. Pull the faulty airflow control cap off the socket and discard it. Install a new airflow control cap by stretching the center ring over the pulomatic socket and seat it securely. Connect the hose pulomatic plug to the pulomatic socket.

3-8. Transformer

Operator maintenance of the transformer is restricted to inspection. Inspect the transformer case and wiring for damage and loose or broken connections. Report deficiencies to organizational maintenance.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. New Materiel

a. General. The filter unit is received by organizational maintenance personnel packed in a wood box (fig. 4-1). Open the wood box by cutting the metal straps and removing the lid, taking care not to damage the contents. Unpack the filter unit from the box. Check the packing list against the contents of the box to insure that the filter unit is complete (fig. 4-2). Retain the box with packing for future storage of filter unit or for moving filter unit to another location.

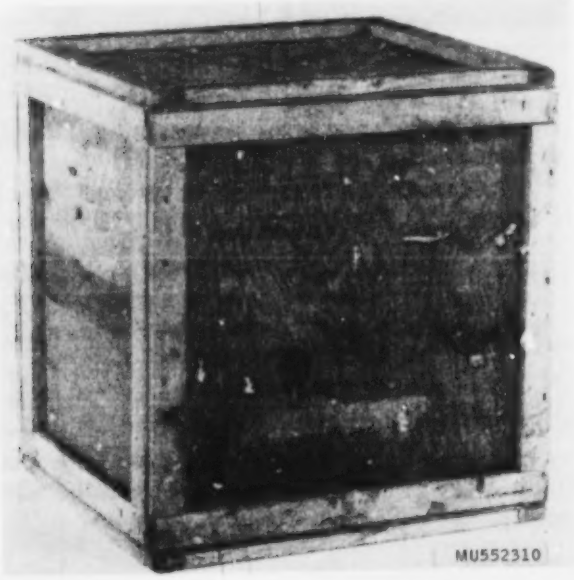


Figure 4-1. Filter unit, crated.

b. Air Purifier. Unpack the air purifier (fig. 1-4) from its sealed container. Examine the air purifier externally for damage. Remove the manifold assembly (para 4-7) and see that the gas and particulate filters are in place and undamaged. See that electric receptacle connector for purifier power cable is not damaged. See that manifold assembly is equipped with airflow control caps on each pulomatic socket. See that the nameplate is fastened to housing and that it is legible. See that pulomatic sockets are not out of round or damaged. See that external surfaces are painted white.

c. Transformer. Unpack the transformer (fig. 1-5) from its sealed container. Check the transformer case for damage. See that the 115 volt ac power cable and plug are undamaged. See that the 24 volt dc power cable, red and black plastic cable nipples, and clips are undamaged. See that air purifier power cable and 90° connector are undamaged. Make sure that toggle switch is in OFF position. See that case is painted white and that markings are legible.

d. Hose Assemblies. Unpack the six size 2 and two size 3 hose assemblies (fig. 1-3) from their boxes. See that the size 2 and size 3 hose assemblies including the hose connectors are undamaged.

e. Headpieces. Unpack the headpieces (fig. 1-2). Check each headpiece and headpiece carrier for damage. Check that there are six headpieces and six headpiece carriers. Check each inlet adapter mount for damage, missing gasket, and being out of round. See that outlet valve disk is present.

f. Installation Instructions.

(1) Plug 2 each size 2 hose assemblies (fig. 1-3) into the Y-fittings and socket on each of the size 3 hose assemblies.

(2) Plug the two remaining size 2 hose assemblies into the loose plug and socket Y-fitting.

(3) Plug the plug and socket Y-fitting (fig. 1-3) into the pulomatic socket (fig. 1-4) on the manifold assembly (fig. 2-1).

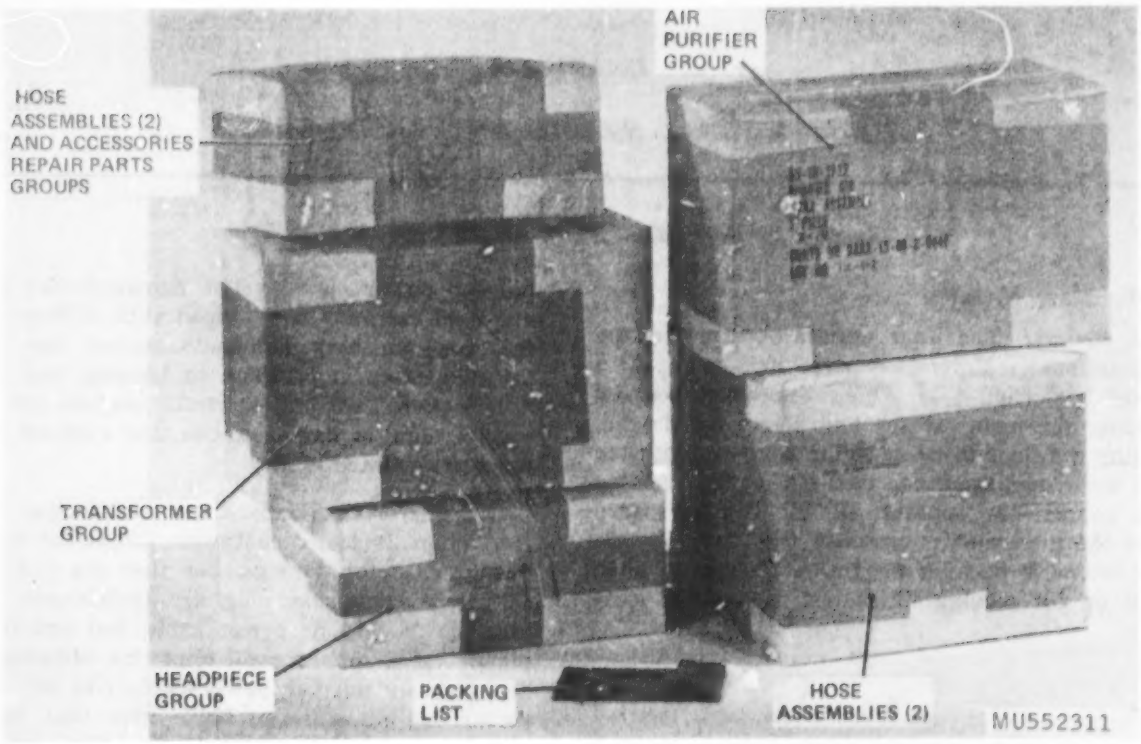


Figure 4-2. Filter unit, partially unpacked.

(4) Plug the pulomatic plugs on the size 3 hose assemblies into two sockets of the manifold assembly.

(5) Place the solid airflow control cap (fig. 2-1) over the socket on the fourth air outlet of the manifold assembly.

(6) Locate the air purifier so that the hoses can reach the beds of the six patients (fig. 2-1).

(7) Install loop clamps to support the hose assemblies as required.

(8) Use wood screws and/or machine screws and nuts to fasten the clamps.

(9) Connect the inlet adapter ends of the hose assemblies to the headpieces on the six beds.

(10) Connect the electrical plug connector end of the air purifier power cable to the air purifier electric receptacle connector.

(11) Connect the 24 volt dc power cable to a 24 volt dc battery or two 12 volt dc batteries connected in series (battery is not supplied with the filter unit). (When two 12 volt dc batteries are used, use a lead storage battery jumper (FSN 6140-843-5245) to connect them together.)

(12) Check that battery is charged, using a hydrometer. Specific gravity should be between 1,275 and 1,290. Check level of electrolyte in battery cells. Add distilled water as required.

(12) Connect battery charger (trickle charger) to batteries. Connect 115 volt ac power cable to 115 volt ac power source. (The battery charger (commercially referred to as trickle charger) must be purchased locally. The trickle charger is connected to the battery during the time that the battery is not being used to power the filter unit.)

4-2. Used Materiel

Unpack the used filter unit in the same manner as a new one (para 4-1). Examine the used filter unit for excessive signs of wear, damage, dry rot, or missing parts. Install a new gas filter and particulate filter (para 4-7), if logbook entries show that one or more conditions in table 2-1 are met. Correct deficiencies, if authorized, or notify direct support maintenance.

Section II. PREVENTIVE MAINTENANCE CHECKS

4-3. General

This section contains instructions for organizataional maintenance who is responsible for preventive maintenance of the filter unit. The preventive maintenance must be performed at the interval prescribed. The interval of maintenance is based on normal operation and will be reduced or extended depending on operating conditions. Defects discovered during preventive maintenance servicing must be corrected if corrective action is authorized in the maintenance allocation chart (MAC). If corrective action is not authorized, notify direct support maintenance.

4-4. Checklist

Table 4-1 lists the preventive maintenance checks and services.

Table 4-1. Preventive Maintenance Checks and Services—Monthly Schedule
Total time required: 1.7 hours

Sequence No.	Item to be inspected procedure	Work time (M/H)
1	*Air Purifier.* Check for dents, loose connections, and loose or missing parts. Repair if authorized.	0.2
2	*Airflow Control Caps.* Check for being damaged or missing. Replace as necessary	Negligible
3	*Gas and Particulate Filters.* Check with operator if any criteria in table 2-1 have been met. Replace filters, if required.	0.5
4	*Battery.* Check battery cells with hydrometer for specific gravity of 1275 to 1290. Check and add distilled water to each battery cell as necessary. Check that battery is not damaged. Recharge battery when required. Make repairs or replace battery.	0.3
5	*Transformer.* Check transformer case and cable leads for damage. Check that toggle switch is not broken. Make repairs if authorized or notify direct support maintenance.	0.1
6	*Hose Assemblies.* Check hoses (approx. 54 feet of hose) for loose or broken fittings. Check for holes or leaks. Check hoses for unusual wear, damage, or missing parts. Repair as necessary.	0.4
7	*Headpieces.* Check headpieces for cleanliness and damage. Replace as necessary	0.1
8	*Carriers.* Check carriers for damage and cleanliness. Replace as necessary	0.1

Section III. TROUBLESHOOTING

4-5. General

This section provides information that is useful to organizational maintenance in diagnosing and correcting malfunctions. Each malfunction is followed by a description of probable causes and corrective actions.

4-6. Troubleshooting Table

Table 4-2, troubleshooting, lists information to help organizational maintenance maintain the filter unit.

Table 4-2. Troubleshooting

Item No.	Malfunction	Probable cause	Corrective action
1	Air purifier does not operate	Faulty connections in air purifier	Replace precleaner and housing assembly. Save manifold assembly, screws, lockwashers, airflow control caps, gas filter, and particulate filter for reuse.
2	Lack of air at headpieces	*a.* Blocked hose	*a.* Remove foreign matter from interior of hose.
		b. Leak in hose	*b.* Replace hose.
		c. Hoses not connected to Y-connectors, headpieces, or air purifier or headpiece.	*c.* Connect hoses.
		d. Defective air purifier	*d.* Replace precleaner and housing assembly. Save manifold assembly, screws, lockwashers, airflow control caps, gas filter, and particulate filter for reuse.
3	Air purifier operates on ac but not on dc.	*a.* Faulty transformer	*a.* Replace transformer.
		b. Battery discharged	*b.* Recharge battery.

Section IV. MAINTENANCE INSTRUCTIONS

4-7. Filter Replacement

a. Description. The gas filter is about 1 inch thicker than the particulate filter. The particulate filter has two rubber gaskets. The gas filter has a felt gasket cemented to the retainer. The particulate filter rests against the bulkhead of the air purifier. The gas filter is installed on top of the particulate filter with the felt gasket facing out. The manifold assembly presses against the felt gasket of the gas filter. The manifold is fastened in place to the housing by four screws and lockwashers.

b. Removal.

WARNING

The unit commander or senior officer in charge of maintenance personnel assigned to remove and dispose of the contaminated gas filter and particulate filter must prescribe the necessary protective clothing (TM 10-277) to be worn during this operation. He must also prescribe the necessary safety measures to be followed including decontamination operation that must be performed before new filters are installed in the housing assembly (TM 3-220).

WARNING

A contaminated gas filter and particulate filter must be removed and disposed of only by adequately trained personnel (FM 21-40). The headpieces should be decontaminated after each use. After the headpiece is used, it is considered contaminated.

WARNING

Disconnect the power cable with 90° plug connector from the air purifier before performing maintenance.

(1) Remove four screws and lockwashers that fasten the manifold assembly (fig. 4-3) to the air purifier housing. Pull the manifold assembly from the housing.

(2) Remove the gas filter and the particulate filter from the housing. If the filters are to be reinstalled, mark the particulate filter housing so that when it is reinstalled, airflow through it will be in the same direction as before removal.

(3) Discard contaminated or damaged filters in accordance with the unit standing operating procedures. Decontaminate the surfaces of of the air purifier housing (TM 3-220). Replace the precleaner and housing assembly if required.

c. Air Deflector. Remove screw and lockwasher holding air deflector in place. Remove air deflector. Inspect air deflector for damage and contamination. Clean as necessary. Replace a damaged air deflector.

d. Installation.

(1) Place the particulate filter in the housing so that air will flow through it in the direction marked on the filter housing. Make sure the filter rests against the bulkhead inside the air purifier housing.

(2) Place the gas filter in the housing so that it rests on the gasket of the particulate filter surface. Make sure that the deeply recessed side containing the felt gasket of the gas filter is turned toward the manifold assembly end of the air purifier.

(3) Install the manifold assembly. Fasten the manifold assembly to the housing using the four screws with lockwashers that were removed. Connect the electrical plug connector to the electric receptacle connector (fig. 1-4).

4-8. Precleaner and Housing Assembly

Organizational maintenance is authorized to replace the precleaner and housing assembly as one piece. Do this by removing the manifold assembly and filters as described in paragraph 4-7*b*.

4-9. Transformer

To remove the transformer, disconnect the three power cables. To install the transformer, connect the three power cables. Connect the elec-

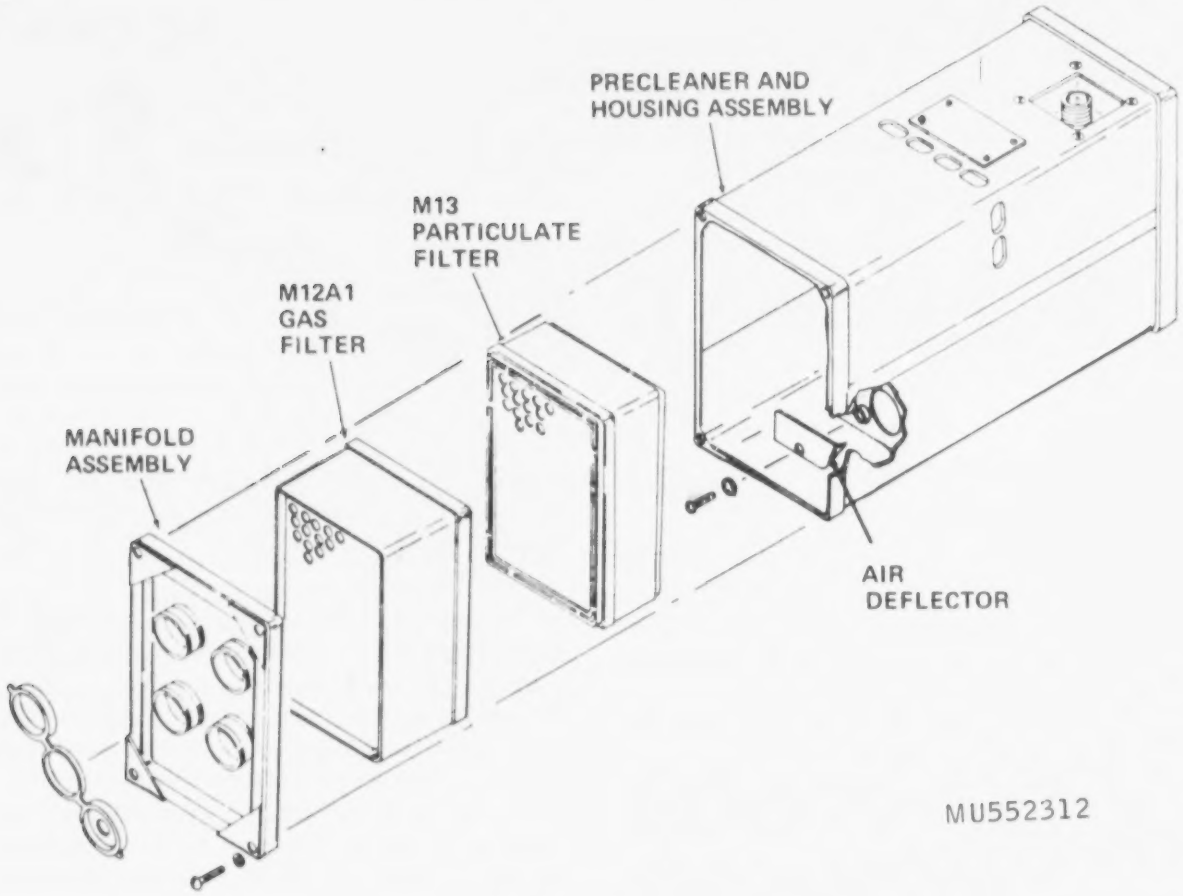


Figure 4–8. Filter replacement.

trical plug connector to the electric receptacle connector. Connnect the 24 volt dc power cable to the 24 vdc battery. Connect the 115 volt ac power cable to 115 volt ac power source.

4–10. Hose Assemblies

a. General. This paragraph contains instructions for organizational maintenance for the repair of the size 2 and size 3 hose assemblies used in this filter unit. Six size 2 hose assemblies (para 1–4*c*(1)), and two size 3 hose assemblies (para 1–4*c*(2)) are required for each filter. These hose assemblies carry purified air from the air purifier to the six headpieces.

b. Size 2 Hose Assembly Repair. The following procedures are for one size 2 hose assembly.

(1) *Disassembly.*

(*a*) Remove the inlet adapter from the headpiece.

(*b*) Remove the pulomatic plugs from the Y-fitting.

(*c*) Remove the damaged hose from the bed by removing the wood or machine screws and loop clamps (fig. 4–4).

(*d*) Use a sharp pointed tool and disengage the lock lever part of the ratchet clamp from the teeth of the lock. Repeat this procedure to remove ratchet clamps as necessary.

(2) *Inspection.* Inspect the ratchet clamps, inlet adapter, pulomatic plug, loop clamps, and hose for damage, excessive wear, and dry rot. Replace damaged parts as necessary.

(3) *Assembly.*

(*a*) Place ratchet clamps on the ends of the hose. Insert a pulomatic plug or inlet adapter as required into hose. Tighten the ratchet clamps using slip joint pliers. The teeth of the lock lever engage the loop portion of the clamp when pliers are released.

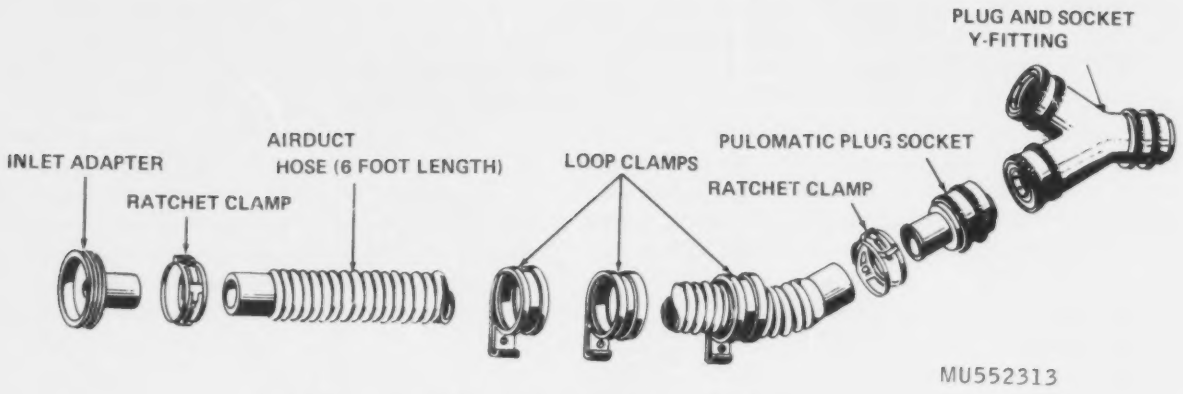


Figure 4-4. Size 2 hose assembly, exploded view.

(*b*) Assembly is reverse of disassembly ((1)(*a*) through (*d*) above).

c. Size 3 Hose Assembly Repair. The following procedures are for one size 3 hose assembly.

(1) *Disassembly.*

(*a*) Remove the inlet adapter from the headpiece.

(*b*) Remove the pulomatic plug from the Y-fitting and socket as required.

(*c*) Remove the damaged hose from the bed by removing the wood or machine screws and loop clamps (fig. 4-5).

(*d*) Use a sharp pointed tool and disengage the lock lever part of the ratchet clamp from the teeth of the lock. Repeat this procedure to remove ratchet clamps as necessary.

(2) *Inspection.* Inspect the ratchet clamps, Y-fitting and socket, pulomatic plug, and hose for damage, excessive wear, and dry rot. Replace damaged parts as necessary.

(3) *Assembly.*

(*a*) Place ratchet clamps on the ends of the hose. Insert a Y-fitting and socket and/or pulomatic plug as required into hose. Tighten the ratchet clamps using slip joint pliers. The teeth of the lock lever engage the loop portion of the clamp when pliers are released.

(*b*) Insert pulomatic plug end into the pulomatic socket in manifold assembly. Connect two size 2 hoses to Y-fitting and socket end of the hose assembly.

(*c*) Install loop clamps as required on each hose and fasten to bed using the wood/machine screws previously removed.

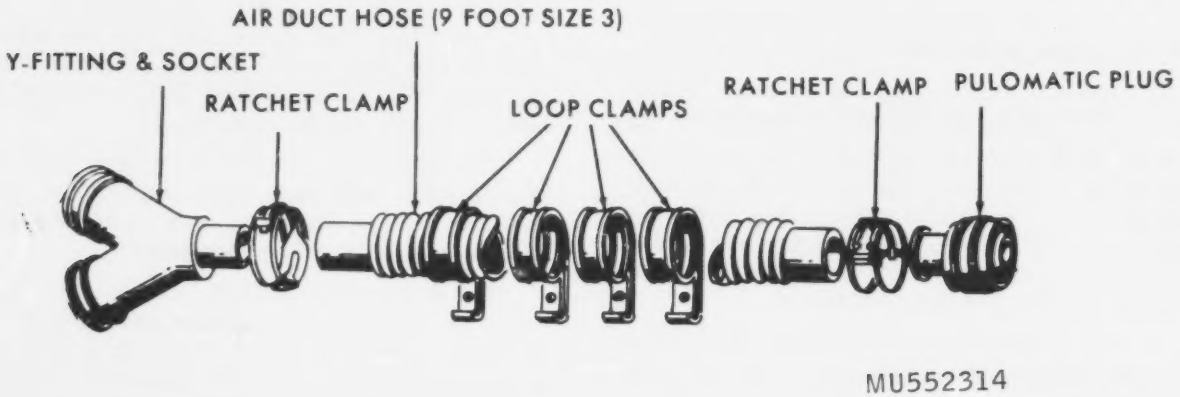


Figure 4-5. Size 3 hose assembly, exploded view.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Section I. PRECLEANER AND HOUSING ASSEMBLY

5–1. Description

The M1A1 air purifier precleaner (fig. 5–1) consists of an electric-motor-driven centrifugal fan, a dust separator, a mounting plate, rubber channel seals, lockwashers, and screws. The centrifugal fan includes an electrical receptacle connector and cup switch. The electric motor operates on 30 volts ac or 24 volts dc electrical power. When the electric motor is operating, the centrifugal fan draws in air through eight openings in the purifier housing. It blows the air into the dust separator, which traps the dust. The air then flows from the dust separator through two large holes in the housing bulkhead. Also, dirt trapped by the dust separator is blown from the air purifier through two outlets in the end plate. The air deflector, which is mounted on the filter side of the housing bulkhead, deflects the airstream so that the air flows evenly through all parts of the particulate filter rather than through a small area of the filter.

5–2. Inspection

Inspect the steel housing of the precleaner and housing assembly for dents, cracks, and other damage.

5–3. Disassembly, Repair, Assembly, Installation, and Test

a. End Plate. Remove six screws, lockwashers, and nuts that hold the end plate in the housing. Remove four screws and washers that hold switch cup to the housing. Insert a brass nonmetallic drift pin through the switch cup hole in the housing against the inside surface of the end plate. Use a hammer against the drift pin and drive the end plate free of the housing. Examine the rubber grommets to make sure they are not deteriorated. Remove the grommets by working them free of the end plate (fig. 5–1). Clean all parts as necessary. Discard all faulty parts and replace with new ones.

b. M1A1 Air Purifier Precleaner. If repair

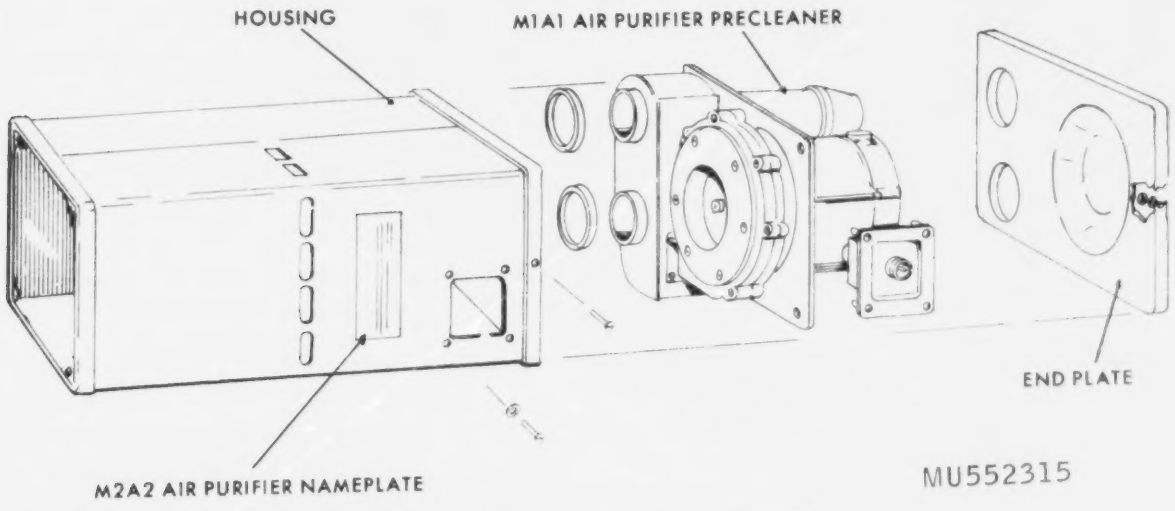


Figure 5–1. Precleaner and housing assembly.

of the M1A1 air purifier precleaner (fig. 5–2) is required, remove it as a unit from the precleaner and housing assembly (fig. 5–1).

(1) Remove the end plate (*a* above).

(2) Remove four screws that fasten the mounting plate to the housing.

(3) If the nameplate on the housing is fastened by four screws (rather than rivets) back the two screws at the bottom of the nameplate out of the housing so that the mounting plate will slide free of the housing. The centrifugal fan, the dust separator, and the mounting plate are removed as a unit.

(4) Remove four screws and lockwashers that fasten the mounting plate to the floating anchor nuts. Remove four screws, lockwashers, and nuts that fasten the receptacle connector to the switch cup. Removing these screws also frees the electric wire leading to the electric motor. Replace the receptacle connector, terminal lug, and the switch cup as necessary.

c. Assembly. Make sure the nameplate is in the holder (M2A1 air purifier only) and that it is legible. If the nameplate is damaged, illegible, or missing, replace it. Be sure that a rubber seal (fig. 5–2) is on each dust separator tube.

d. Precleaner and Housing Assembly. Repair the precleaner and housing assembly if it was accidentally damaged, improperly alined, or dirty. Straighten the housing so that the gas and particulate filters fit tightly when they are installed in it.

e. Installation. Instructions for assembling the M1A1 air purifier precleaner are the reverse of the procedure contained in paragraph *b* above.

f. Airflow Test. Test for 1.75 to 2.3 cfm of airflow at each headpiece using the filter unit gas-particulate airflow tester (FSN 6680–436–

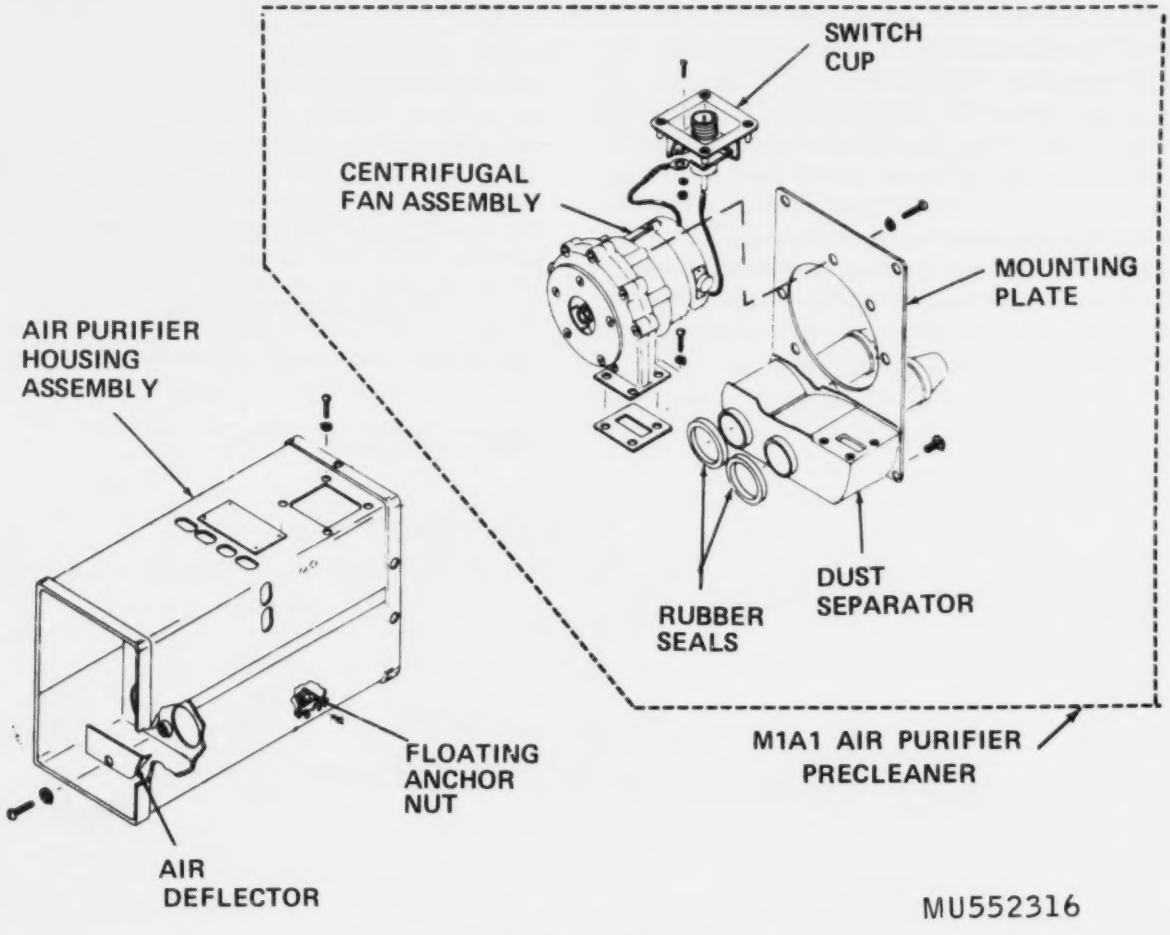


Figure 5–2. M1A1 air purifier precleaner.

4212) (fig. 5-3). Instructions for use of the airflow tester are contained inside the tester case. If the air purifier does not pass test (1.75 to 2.3 cfm of airflow), replace the particulate filter.

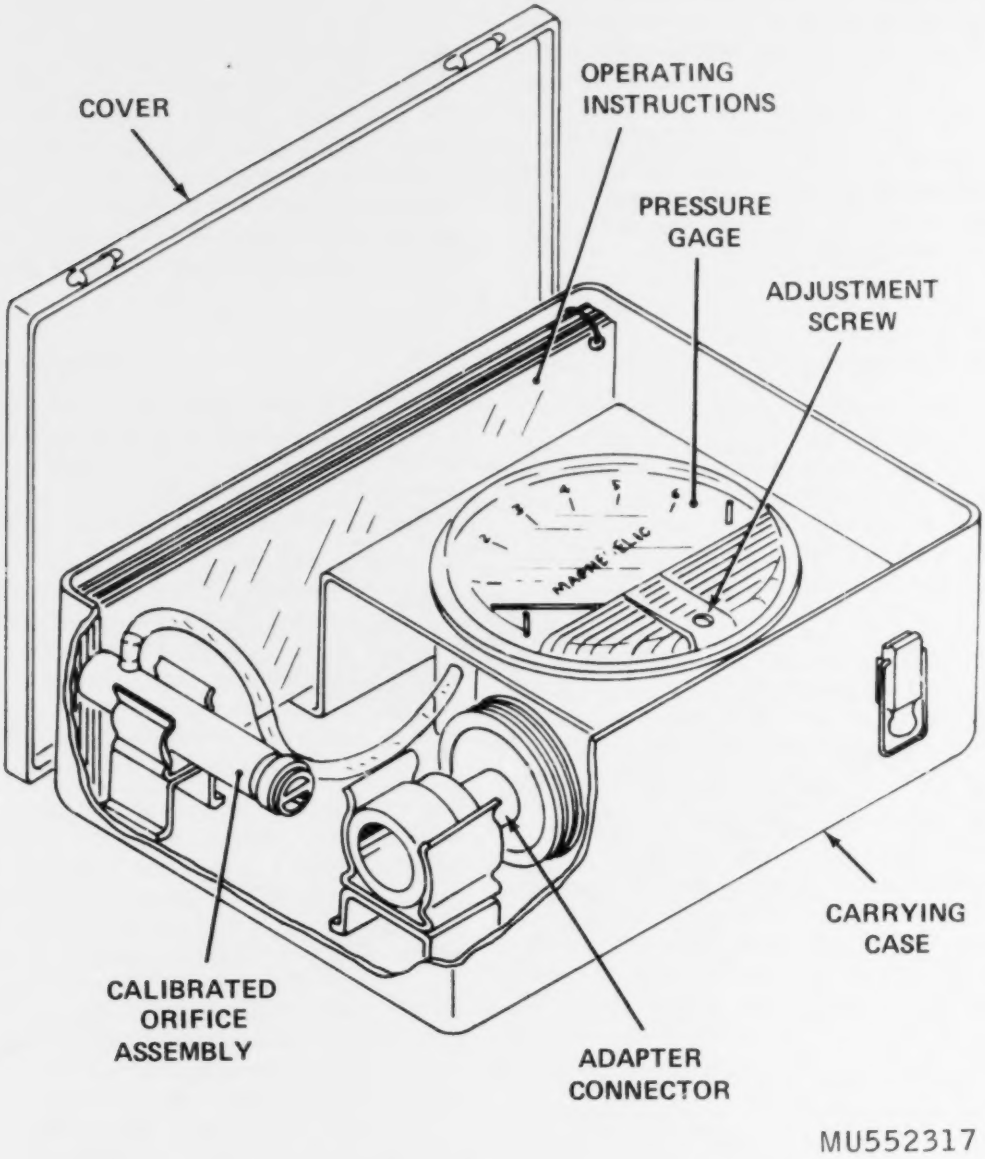


Figure 5-3. Filter unit gas-particulate airflow tester.

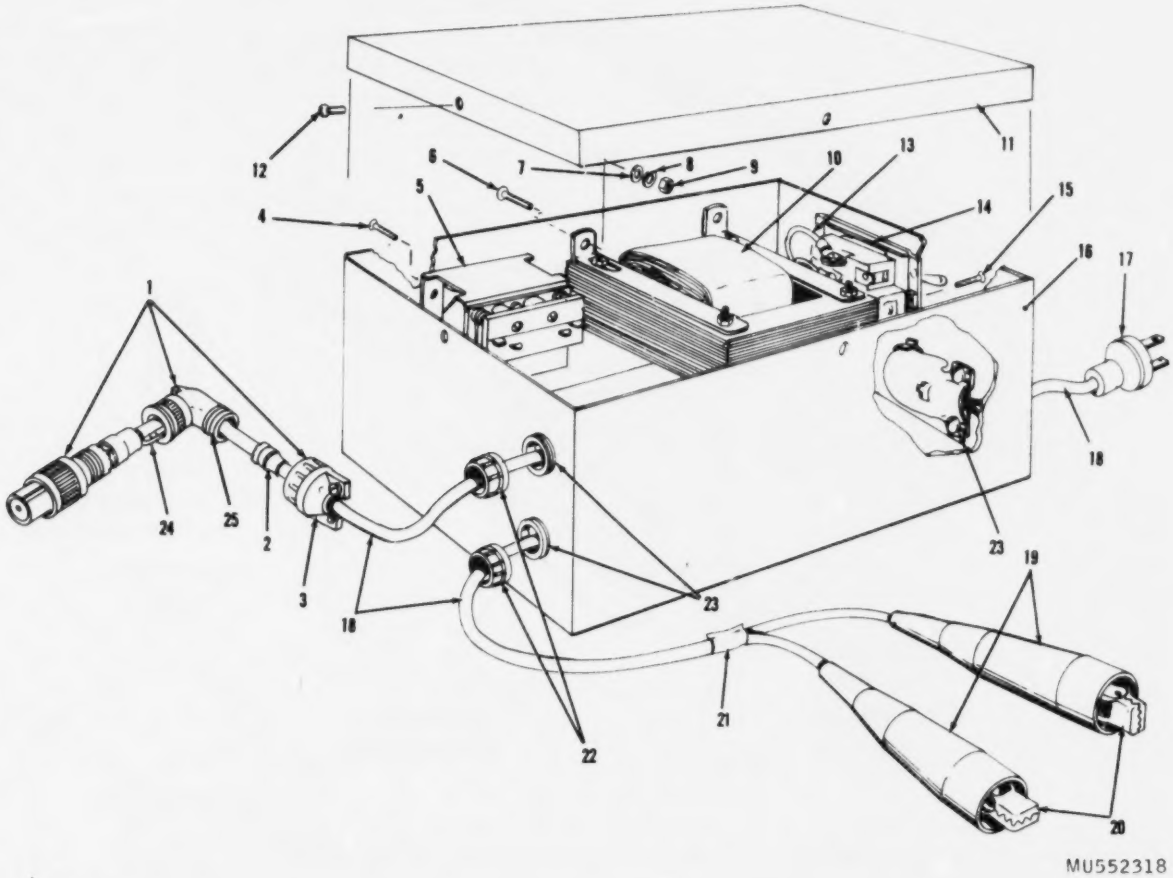
Section II. TRANSFORMER

5-4. Description and Function

a. Description. The transformer is partly described in paragraph 1-4*e*. The components that may be replaced by direct support maintenance are the stepdown power transformer (10, fig. 5-4), the relay (5), the toggle switch (14), and the power cables (18). The stepdown power transformer requires an input of 115 volts 60 Hz ac,

the secondary winding output is 30 volts. The relay is a double pole double throw relay that operates on 115 volts 600 Hz ac. The toggle switch is a three pole single throw switch. The three power cables are two conductor rubber covered cables. Two power cables are 3 feet long and the other is 6 feet long. The 115 volt ac power cable has a plug connector. The 24 volt dc power cable has two battery electrical clips and two cable nipples. The cable nipples are made of plastic and are used to insulate the electrical clips. The battery electrical clips are lead plated spring clips with terminals. The air purifier power cable has a 90° electrical connector.

b. Function. The function of the transformer is shown in figure 1-6. When the toggle switch is turned on, the 115 volt ac power flows through the primary winding of the transformer (10, fig. 5-4) and through the armature of the relay (5), energizing the relay. The secondary winding of the step down power transformer (10) supplies 30 volts ac power through the first set of contacts in the relay, through the toggle switch (15), and through the air purifier power cable to operate the electric motor in the centrifugal fan assembly. If the 115 volt ac power source fails (or if this power is removed for any reason), current ceases to flow through



1 Electrical plug connector assembly
2 Sleeving
3 Electrical connector cable clamp
4 Machine screw (4 places)
5 Relay
6 Machine screw
7 Flat washer
8 Lockwasher
9 Nut
10 Step down power transformer
11 Transformer cover
12 Machine screw
13 Insulated electrical wire
14 Toggle switch
15 Machine screw
16 Transformer case
17 Electrical plug connector
18 Electrical power cables
19 Plastic electrical cable nipples
20 Battery electrical clip
21 Plastic electrical insulation tape
22 Electrical conduit bushing
23 Electrical style box connector
24 Ground wire
25 90° housing of connector

Figure 5-4. Transformer details.

the armature of the relay (5). When the armature of the relay is deenergized, the relay mechanically switches to close a second set of contacts. The 24 volt dc power source is connected through the second set of contacts in the relay, through the toggle switch, and through the air purifier cable to operate the electric motor in the centrifugal fan assembly. If at any time during operation, 115 volt ac power becomes available, the current flows through the primary winding of the transformer and the armature of the relay. Actuating the armature of the relay disconnects the 24 volt dc power source and connects the 30 volt ac power from the step down power transformer.

5-5. Maintenance

a. Transformer Case. Determine whether the case or cover is damaged. Replace if necessary. Check all circuits within the transformer case for continuity using a voltmeter or ohmmeter. Replace defective parts and check for continuity.

b. Power Cables. Disconnect the ac and dc power sources. Inspect the power cables for damaged insulation, connectors, electrical connector cable clamp, and battery electrical clips. If inspection reveals damage, disassemble or remove ((1) through (4) below). Assembly or installation procedure is the reverse of removal of disassembly procedure.

(1) *Replacing battery electrical clips and cable nipples.* The cable nipples (19, fig. 5-4) are made of plastic and are used to insulate the battery electrical clips (20). Slide the cable nipples back along the battery power cable (18) far enough to expose the screw terminals on the battery electrical clips. Loosen the screws and disconnect the clips from the cable. Examine the red and black colored plastic cable nipples (19) at this time. If the cable nipples require replacement, do it while the electrical clips are disconnected. Install a cable nipple by pushing a wire from the battery power cable through the nipple. Install battery electrical clips by reconnecting the wires to the clips. Slide the nipples over the battery clips leaving only the jaws exposed.

(2) *Power cables.* Remove the transformer cover (11, fig. 5-4). To disconnect one or all three power cables (18) from the transformer case (16), unscrew the electrical conduit bushing (22), loosen the electrical box connector (23), and disconnect the wires of the cables from their points of connection inside the transformer case. Pull wiring clear of transformer case. Installation is the reverse of removal procedure.

(3) *90° plug connector.* When removing the electrical plug connector assembly (1) on the air purifier power cable (18), unscrew the electrical connector cable clamp (3) from the electrical plug connector (1). Slide sleeving (2) back (or up wire) from the connector. Cut the wire. Prepare the end of the power cable (18) for a new electrical plug connector (1). Solder one wire to connector terminal. Bind the ground wire (24) (stripped of insulation) back along cable so that it comes into contact with the 90° housing of connector (25). This acts as a ground. Push the sleeving (2) back into place and reassemble the connector. Tighten the two screws so that the clamp firmly grips the cable (18).

(4) *Plug connector.* Remove the plug connector (17) from the 115 volt ac power cable by removing the screws which fasten the wires to the terminals of the connector; then pull the plug connector from the power cable. Strip insulation from power cable. Fasten wires to each terminal by wrapping the lead under the screw. Tighten screw.

c. Relay. Inspect the contacts and clean them if necessary. Tag and disconnect or unsolder the electrical wires from the relay (5) terminals. Remove machine screws (4) and remove the relay from the transformer case.

d. Toggle Switch. Tag and disconnect the electrical wires (13) from the toggle switch (14). Remove machine screws (15) and remove toggle switch (14) from transformer case (16). Fasten the toggle switch inside the transformer case using the machine screws. Fasten the insulated electrical wiring (13) to the terminals on the toggle switch (14).

e. Transformer. Tag and disconnect the insulated electrical wires from the transformer (10). Remove machine screws (6), flat washers (7), lockwashers (8), and nuts (9). Remove the transformer from the transformer case (16). Fasten the transformer in the case using the four screws (6), flat washers (7), lockwashers (8), and nuts (9). When connecting wires, make sure that the primary winding of the transformer is connected to 115 volts 60 Hz ac wiring (fig. 1-6). Make sure that the secondary winding of the transformer is connected to 30 volts ac wiring as shown in figure 1-6.

APPENDIX A

REFERENCES

DA Pamphlet 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders
FM 5-25	Explosives and Demolitions
FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense
SB 700-50	Expendable Items: (Except Medical, Class V, Repair Parts and Heraldic Items)
TM 3-220	Chemical, Biological, Radiological (CBR) Decontamination
TM 9-1375-200	Demolition Materials
TM 10-277	Protective Clothing Chemical Operations
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 740-90-1	Administrative Storage of Equipment

APPENDIX B

BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists basic issue items and items troop installed or authorized required by the crew/operator for operation of the M7A1 filter unit.

B-2. General

This Basic Issue Items and Items Troop installed or Authorized List is divided into the following sections:

a. Basic Issue Items List—Section II. Not applicable.

b. Items Troop Installed or Authorized List—Section III. A list, in alphabetical sequence, of items which, at the discretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

B-3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings.

a. Source, Maintenance, and Recoverability Codes (SMR), (5 Positions).

(1) *Source codes (positions 1 and 2).* Indicates the source for the listed items. Source codes are:

Code	*Explanation*
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purposes because essentiality dictates that a minimum quantity be available in the supply systems.
PC	Item procured anc stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which because of probable discontinuance or shutdown of production facilities would prove uneconomical to reproduce at a later time.
KD	An item of depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at the direct support maintenance level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
MD	Item to be manufactured or fabricated at depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at the direct support maintenance level.
AH	Item to be assembled at the general support maintenance level.
AD	Item to be assembled at depot maintenance levels.
XA	Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.
XB	Item is not procured or stocked. If not available through salvage, requisition.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturers' part number.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded XA and aircraft support items as restricted by AR 700-42.

(2) *Maintenance codes (positions 3 and 4).*

(*a*) *Position 3.* The maintenance code entered in third positon indicates the lowest maintenance level authorized to remove, replace, and use the support item. Capabilities of higher maintenance categories are considered equal or better. Maintenance codes are:

Code	*Explanation*
C	Crew/operator
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

(*b*) *Position 4.* The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). Capabilities of higher maintenance categories are considered equal or better. Maintenance codes are:

Code	*Explanation*
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance
Z	Non-reparable. No repair is authorized.

(3) *Recoverability code (position 5).* Indicates whether unserviceable items should be returned for recovery or salvage. Recoverability codes are:

Code	*Explanation*
Z	Non-reparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
F	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/Specialized Repair Activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the Federal item name and a minimum description required to identify the item. The last line indicates the reference number followed by the applicable Federal Supply Code for Manufacturer (FSCM) in parentheses. The FSCM is used as an element in item identification to designate manufacturer or distributor or Government agency, etc., and is identified in SB 708-42.

d. Unit of Measure (U/M). Indicates the standard or basic quantity by which the listed item is used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, e.g., ea, in., pr, etc., and is the basis used to indicate quantities and allowances in subsequent columns.
When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

e. Quantity Furnished with Equipment (Basic Issue Items Only). Not applicable.

f. Quantity Authorized (Items Troop Installed or Authorized Only). Indicates the quantity of the item authorized to be used with the equipment.

B-4. Special Information

Not applicable.

B-5. Abbreviations

Abbreviations	*Explanation*
amp	ampere(s)
v	volts(s)

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR Code	(2) Federal stock No.	(3) Description Reference Number & Mfr. Code — Usable On Code	(4) Unit of Meas	(5) Qty Auth
PA OZ Z	6140-059-3528	BATTERY, STORAGE 24 v, 21 amp capacity, acid electrolyte MS75047-1 (96906)	ea	1
		or		
PA OZ Z	6140-057-2554	BATTERY, STORAGE 12 v, 100 amp capacity, acid electrolyte MS35000-3 (96906)	ea	2
		Note. Any other available 24 volt storage battery, or 2 each 12 volt storage batteries connected in series, may be substituted for batteries listed above.		

APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTON

C-1. General

The maintenance allocation chart (sec. II) lists the authorized maintenance functions assigned the maintenance categories for maintenance of the ABC-M7A1 hospital gas-particulate filter unit. This chart is to be used by all levels of maintenance to insure complete support of the equipment.

C-2. Maintenance Functions

Maintenance functions authorized are limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, preserve, drain, paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to deteet and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, module (component or assembly) in a manner to allow the proper functioning of an equipment/system.

i. Repair. The application of maintenance services (inspect, test service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, end item or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.g., DMWR) in pertinent technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new conditon in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

C-3. Explanation of Format

Purpose and use of the format are as follows:

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to match components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Functional Group. Column 2 lists the next higher assembly group and the item names of components, assemblies, subassemblies, and modules within the group for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the eleven maintenance functions defined in C-2 above. Each maintenance function required for an item shall be specified by the symbol among those listed in *d* below which indicates the level responsible for the required maintenance. Under this symbol, there shall be listed an appropriate work measurement time value as indicated in *e* below.

d. Use of Symbols. The following are to prescribe work function responsibility:

Symbol	*Explanation*
C	Operator/crew maintenance
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

e. Work Measurement Time. The active repair time required to perform the maintenance function is included directly below the symbol identifying the category of maintenance. Active repair time is the average aggregate time required to restore an item (subassembly, assembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, fault isolation/diagnostic time, and QA/QC time in addition to the time required to perform specific maintenance functions identified for the tasks authorized in the maintenance allocation chart. This time is expressed in man-hours and carried to one decimal place (tenths of hours).

f. Column 4, Tools and Equipment. Column 4 lists those peculiar tools and test, measuring, diagnostic, and support equipment used in performing the authorized maintenance functions.

g. Column 5, Remarks. Self-explanatory.

Section II

MAINTENANCE ALLOCATION CHART

FOR

FILTER UNIT, GAS-PARTICULATE, HOSPITAL, SIX-MAN, 12 CFM, ABC–M7A1

(1) Group Number	(2) Functional Group Component Assembly Nomenclature	(3) Maintenance Function											(4) Tools and Equipment	(5) Remarks
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild		
100	HEADPIECE												Tester, Airflow, Gas-Particulate, Filter Unit, FSN 6680–436–4212	Organizational maintenance personnel will use tester to check for satisfactory output of filter unit installation.
	Headpiece, M13A1	C 0.1		C 0.1					C 0.1					
200	HOSE ASSEMBLIES													Tester will also be used in organizational preventive maintenance check to determine when to replace particulate filter.
	Hose assemblies	C 0.1							O 0.3	O 0.4				
300	AIR PURIFIER													Instructions for use of tester are provided with tester. 1. External inspection. 2. External cleaning. 3. Functional test.
	Purifier, air, M2A2	C [1] 0.1		C [2] 0.6					O 0.1	O 0.5				
	Precleaner and housing assembly	C 0.1	F 0.2	O 0.1					O 0.1	F 1.0	H 1.5			
	Precleaner, air purifier, M1A1	F 0.2	F [3] 0.3						F 1.0	F 1.5				
400	TRANSFORMER	C	F	C					O	F				
	Transformer Unit	0.1	0.5	0.1					0.1	1.0				

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